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Progress in the implementation of the programme of action for the sustainable development of small island developing States

Report of the Secretary-General

Addendum

Land resources in small island developing States*

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I. Land resources issues

1. Human settlements, agriculture, commerce, industry and tourism development have historically been the major competing uses for limited land resources in many small island developing States. As human needs and population grow, the pressure on land and other natural resources continue to increase. The most significant issues for land and related resources identified for the South Pacific are outlined in box 1.

2. Many factors and causal relationships influence the management of land resources. Increased demand for monetary income has led to greater production of cash crops for export and to inappropriate tourism development. For agriculture, this has meant increased areas under cultivation and more mechanized production systems. Land pressures in some small island developing States have been further worsened by the intensification of animal production, particularly high-input production chains that are dependent on concentrate feed. Unsustainable agricultural practices have contributed to deforestation; changes in cropping pattern, with consequent losses of biodiversity across the landscape; loss of soil fertility; and agrochemical pollution of soils, freshwater and coastal resources downstream. Furthermore, land tenure and other policy issues critically affect land management, as do a multiplicity of socio-economic factors, such as trade and the influence of outside markets, traditional and cultural practices, and demographics. Small island developing States rarely have an extensive and stable cadre of professional expertise. For this reason, there is a lack of information on land resources and appropriate tools, best practices and technologies for implementing sustainable land-use options and making informed policy decisions.

3. National decisions and the capacity to manage land resources sustainably can also be constrained by other factors, including a lack of institutional capacity to properly negotiate rights to exploit natural resources by foreign companies. Poorly designed projects financed by donors have sometimes been based on purely economic considerations, without taking due account of local environmental conditions and national priorities, as a result of inappropriate forestry and tourism policies. The substantial degradation and depletion that has occurred has begun to focus the attention of communities to implement sustainable management of the remaining resources.

II. Actions taken to address the issues

4. Efforts have been undertaken to address the key issues identified in the Programme of Action for the Sustainable Development of Small Island Developing States by multiple stakeholders, including international agencies, national Governments; international, national and local non-governmental organizations; and small island developing States communities. Regional efforts supported by these different stakeholders have been successful in coordinating collective needs, strategies and information flow. Some examples of efforts at addressing key issues are outlined below.

A. Information systems, integrated land planning and management

5. The World Bank, the Inter-American Development Bank, the Caribbean Development Bank, the United States Agency for International Development (USAID) and the Food and Agriculture Organization of the United Nations (FAO) have funded projects in several small island developing States for the following purposes: the design of policy instruments; environmental impact assessments; the preparation of guidelines and draft legislation for several aspects of land use planning and management; institutional strengthening; surveys and resource assessments; and watershed and protected areas management.

6. The United Nations Development Programme (UNDP) and the United Nations Centre for Human Settlements (Habitat) have been assisting small island developing States in the Caribbean with the development and expansion of computer-based geographical information systems (GIS). Regional training needs have been assessed and a programme of assistance formulated. One outcome of a ministerial meeting in Barbados in 1995 was the establishment of a task force comprising Barbados, Jamaica, Saint Vincent and the Grenadines, the Organization of the Eastern Caribbean States/Natural Resources Management Unit (OECS/NRMU) and Habitat to initiate work on a harmonized regional database. In addition, institutional strengthening and capacity-building measures have been undertaken at the national level in many countries, with the support and assistance of Habitat and UNDP. These include technical cooperation programme initiatives, fellowships, and in-service training.

Box 1. Land resources issues specific to South Pacific small island developing States (FAO/SPREP, 1996)

Land. High population growth rates (as high as 4.2 per cent in the Marshall Islands) has increased the pressure on land and has led to an intensification of land use. The availability of agricultural land in hectares (ha) per head of population has been on the decline in most small island developing States. The ratio of agricultural land to agricultural population has varied widely, from 7.63 ha in Samoa to only 0.36 ha in the Solomon Islands in 1994. Customary land tenure disputes and difficulties hamper access (non-availability, no titles, no security) to land for better management. Islands with sloping land areas have little access to appropriate technologies to extend land use, for example, for sustainable farming on steep slopes. Stakeholders are in conflict over farming, infrastructure (in particular road-building) and residential uses, especially in coastal areas.

Forest resources. The rate of logging or loss of tree cover is relatively high. The current use of logging practices is often unsound and unnecessarily destructive. Forest areas are cleared for farming. Consequently, there is increasing soil erosion. In countries where the forest resources are already fragile, the destruction of forests by cyclones is serious. There is little sound forest development or reforestation.

Water resources. The availability of water resources is directly linked to the land-use patterns and utilization of land resources. Insufficient watershed management and logging of forests has led to uncontrolled water flow, and thus to the destruction of land areas through more frequent floods and droughts during wet and dry seasons, respectively. The availability of water resources is in sharp contrast with the constantly increasing water demand from rapid urbanization, new industries, changing lifestyles and more extensive reticulation. In the atoll countries, the balance of supply and demand is critical. Freshwater stocks are subject to contamination from industrial and agricultural wastes, chemicals and rising sea levels. In addition, population pressure, expanding tourism and reduced precipitation in recent decades have resulted in the overexploitation of groundwater and seawater intrusion, with consequent further deterioration of water quality and quantity.

Soil/sand and gravel. Inland soils suffer from an increasing depletion of nutrients and other forms of degradation due to overuse of available land and insufficient land conservation and management practices. The cropping systems are not adapted to the new conditions. In all small island developing States, the most important minerals currently being mined are sand and aggregated materials, for use in construction and landfill. Demand is outstripping traditional supplies in places and causing environmental damage.

7. OECS/NRMU has been sensitizing national Governments in the Eastern Caribbean on the concept of island systems management (ISM). This approach recognizes the need for a holistic approach to the use of island resources. The ISM approach seeks to eliminate sectoral boundaries through the establishment of a multisectoral multidisciplinary mechanism which links a partnership arrangement of public and private sectors, non-governmental organizations and community-based organizations in the decision-making process.

8. FAO is promoting an improved approach to land resources management based upon successful experiences as well as existing approaches developed by other institutions. The approach emphasizes the integration of physical, socio-economic and institutional aspects of land use, and stresses the need for the active participation of all stakeholders in decision-making. Although not specifically developed for small island developing States, this approach is highly appropriate for them. Guidelines and frameworks have been developed, including structural and institutional guidelines on natural resource management in the twenty-first century, and a forthcoming implementation manual for natural resources management (see box 2).

9. A specific project has been completed in Grenada to assist decision makers and land users in sustainable land resources planning and management at the national and parish levels. A critical component of the project is the development of a national computerized land information system to increase the effectiveness of planning and implementation of development activities as well as to address the needs of multiple agencies. This is done through the establishment of GIS and a comprehensive and quality database (see box 3). Land use planning, management and information systems workshops for Caribbean countries have been held in Grenada, resulting in the development of agro-ecological zoning and land use planning guidelines. Similar efforts have been made in Trinidad and Tobago, Saint Lucia and Belize. Information and corporate software (FAO/Soil Profile Database, Ecocrop-1) have been distributed to institutions working on land use characterizations and classification in Fiji, Tonga and Vanuatu.

10. The International Institute for Environment and Development has documented a strategic approach to island development, drawing on its own experience and the experiences of the World Bank and the World Conservation Union.

B. Farming systems and soil management

11. The farming systems approach to development (FSD) is considered to be potentially useful for improving planning and analytical capacity in identifying, developing and implementing ways to improve the productivity and therefore welfare of those involved in agriculture in a manner that is equitable and sustainable. FAO is currently working with the Institute of Research and Extension Training in Agriculture, of the University of the South Pacific in Samoa to implement FSD training sessions and to produce regionally specific training and extension materials. Seven countries in the South Pacific are associated with the project – the Cook Islands, Fiji, Papua New Guinea, Tonga, Solomon Islands, Vanuatu and Samoa. Envisaged outputs include an introduction to the farming systems development for the South Pacific and a study on the farming systems approach to sustainable agriculture development in the South Pacific. Recommendations to institutionalize FSD into national programmes, build further awareness of this approach and train extensionists in the methodology are integral components of the project.

12. Sustainable land stabilization and soil conservation programmes have been undertaken within the broader framework of the protection and enhancement of the fragile island environment in selected small island developing States. A soil erosion control programme was formulated in Jamaica. In Samoa, the preparation of an initiative entitled "World overview of conservation technologies" has been completed. In Barbados, a development programme has been formulated for the stabilization and conservation of the scarce and highly erosion-prone arable lands in the Scotland District and general rehabilitation of agriculture in the area. Training efforts and the strengthening of human resource capacity within the local soil conservation unit have been made. The work resulted in a project entitled "A new framework for conservation-effective land management and desertification control in Latin America and the Caribbean". Sponsored by the Fertilizer Advisory Development Information Network for Asia and Pacific, a subregional workshop on environmentally sound fertilization in the Pacific islands has been held in Samoa.

13. Many Pacific island countries have embraced a project entitled "Framework for action on the conservation of lands in Asia and the Pacific". Among the collaborators are the

Box 2. Integrated land use planning and management: a pragmatic programme for land management and land use planning (FAO/UNEP, 1996)

- Installation of a national task force, comprising technical expertise to deal with the various problems and with the power to take decisions and legal actions. Experience has shown that it is difficult to create such a group. In practice, the task force should be composed of high-level decision makers, who generally do not have the necessary technical expertise, assisted by ad hoc technical groups for specific issues.

- Awareness creation at all levels of the society about the need to increase production while conserving natural resources. The major goal should be to generate debate on these issues, to receive feedback from experience at the grass-roots level and to convey the message that Governments cannot be expected to resolve every local conflict.

- Creation of a national resource database, containing information on physical, economic and legal dimensions of land use planning and management.

- Identification of the natural resource potential and its particular constraints for a range of possible agricultural and non-agricultural land use scenarios.

- Provision of information to land users (top-down) and solicitation of feedback on their objectives, aspirations and priorities (bottom-up). As it is often difficult to hold discussions with all individual stakeholders, this exchange of ideas can be organized through the creation of platforms for negotiation and discussion. This requires the involvement of identified local resource management groups, local chiefs, non-governmental organizations working at the village level and planners.

- Identification of the needs for production and conservation of local communities, and constraints faced by them. Local communities usually have already interesting solutions in hand but lack means and technical support to implement them.

- Development of land management plans based on long-term objectives of both government agencies and stakeholders. Action should be decided through negotiation. The plan should outline needed actions, define the responsibilities and the involvement of the different parties, and lay down ground rules. Follow-up actions should monitor the application of the plan so as to ensure that rules are followed and assess the need for modification of the plan.

- Provision of personnel and means to implement the plans, and enactment of enabling legislation. Enforcement of management plans or rules may be achieved through social sanctions.

Box 3. Grenada: Land Resources Information System (FAO, 1994)

Grenada is highly dependent on agriculture, deriving 90 per cent of its export earnings from this source. The agricultural development strategy of the Government is to improve the productivity of traditional export crops while diversifying into non-traditional crops for export and for agro-industrial integration into the expanding tourist sector. On the island of Grenada, 77 per cent of the land area has slopes exceeding 20 degrees. Only 33 per cent of the soils are deep, well drained and free of cultivation constraints. The rest are rocky or have seasonal drainage problems. The main objectives of the project were to create the technical basis to support rational development and conservation of the country's natural resources information systems.

The Grenada Land Resources Information System (GLRIS) is a computer-based system intended to assist decision makers and land users in land resources planning and management at the national and parish levels. The system, established by the Land Use Division of the Ministry of Agriculture, Lands, and Surveys, in conjunction with FAO, provides a service to a wide range of users, including planners, researchers, natural resource and agricultural managers. GLRIS comprises four components which interact closely to generate needed outputs: (a) a geographically referenced database containing data elements for land resources analysis; (b) models to analyse the data in the database; (c) hardware and software to process models and data; (d) trained staff to operate the system.

The GLRIS database contains information on agro-climate, soils/terrain, hydrology, land use and vegetation, protected areas, topography, plant environmental requirements, crop production systems and forestry production systems. The result is a user friendly and easily updated system which can be used to rapidly provide land suitability assessments, environmental impact assessments, land degradation assessments, land use optimization, planning and natural resource management.

International Board on Soil Resources and Management (IBSRAM) Pacificland Network and the European Union funded Pacific Regional Agriculture Programme. Through the Pacificland Network, the issues related to steep lands and land intensification are being addressed in Fiji, Papua New Guinea, Vanuatu and Samoa. The work is seeking to assess the extent of the problems of land degradation and to develop acceptable technologies for sustainable agriculture based on existing systems and local technical knowledge.

C. Forestry

14. A number of initiatives have been undertaken at the national and regional levels, with the support and involvement of the donor community, including agencies, funds and programmes of the United Nations system in the area of sustainable forestry. In collaboration with UNDP, FAO convened a regional meeting in Barbados in September 1997 to discuss a strategy for supporting the establishment of national forestry policies in Caribbean small island developing States. As a result of the meeting, work has been initiated for elaborating such policies in a number of Caribbean small island developing States, with technical support from FAO. In addition, the UNDP forest capacity-building programme is currently supporting initiatives for the development of national forestry action plans. A project for Jamaica has been recently approved by UNDP's Capacity 21 Management Committee. Watershed management and conservation education projects (see box 4), integrate conservation farming systems and agroforestry practices in addressing the interrelationship of upstream-downstream aspects.

15. Financial assistance and advisory technical services have been provided to support a working group on agroforestry for the Pacific to document the wealth of indigenous and technical knowledge and experience associated with such systems. The agroforestry information toolkit, prepared at a regional participatory workshop in Fiji

Box 4. Watershed management and conservation education in Samoa (FAO, 1994)

This UNDP/FAO project (1992-1995) looked at the interrelationship between the management of upstream and downstream areas within a given watershed. This relationship has been demonstrated through the implementation of soil conservation and watershed management measures, such as conservation plantation, agroforestry practices, plantation of forest and fruit trees by farmers, conservation farming systems, and extension and education programmes for different target groups. A monitoring system has also been developed to increase understanding of the impact of upstream management on water quantity and quality and other downstream resources. The destruction of vegetative cover by frequent tropical cyclones has led to accelerated soil erosion and landslides, with a direct impact on the watershed, agricultural production, water supplies, hydropower generation, lagoons and reefs. The rehabilitation of upstream areas and the participation of local population in conservation of downstream areas are integral parts of the project. The objective is to facilitate the conservation of flora and fauna and improve the socio-economic condition of watershed dwellers.

in 1997, targets extension-level personnel, and will be published as a joint effort of, *inter alia*, FAO, IBSRAM, UNICEF, and 60 national resource persons.

D. Water resources

16. FAO activities in Fiji have addressed sedimentation control and flood mitigation, as well as watershed management and river improvement. Dredging activities in the main rivers in Fiji have resulted in an improvement of poorly drained and underutilized land and led to an agricultural development programme for an area of 6,300 ha in the Central Division. A subsequent project identified the major causes for erosion and the high sedimentation of the Rewa River, and elaborated a detailed programme combining legal aspects, flood control, river regulation and appropriate land management practices for sustainable development of agricultural lands. FAO also put in place a project to increase food production through the expansion of arable land by reducing flood risks and improving the drainage capacity of the major rivers. A water resources assessment was commissioned in February 1997 to provide technical options for introducing small-scale low-cost supplementary irrigation and water control schemes into rainfed cropping sites of a special programme for food security in Papua New Guinea. This is a multidisciplinary project, which is also doing an analysis of socio-economic constraints.

E. Natural areas protection and coastal area management

17. A number of small island developing States are beginning to develop innovative programmes to save their forests and coral reefs. Through these programmes, island peoples can still use their forests and reefs as a traditional source for food, fish, renewable wood products and the sustainable harvesting of the vast majority of species of plants in the forests that are not trees. Small island developing States like Saint Kitts and Nevis and Aruba have planned for the expansion of protected areas.

18. In 1997, FAO completed a draft document that is planned for publication in 1998, entitled "Agriculture, forestry and fisheries and integrated coastal area management", which is applicable in large measure to small island developing States. It covers the issues, perspectives, policy and planning process for integrated coastal area management (ICAM), as well as more specific advisory documents on integrating agriculture, forestry and fisheries in coastal area management and conflict resolution in ICAM.

F. Participatory research and development

19. A USAID-funded programme brought universities, national programmes, non-governmental organizations and farmers together in Cape Verde. The programme resulted in changes in the national agricultural research system of Cape Verde, the establishment of an institutional framework for

long-term research planning; the establishment of a participatory monitoring and evaluation programme; the establishment of inter-institutional collaboration and implementation of interdisciplinary research; the establishment of linkages with farmers and the extension service; and conduct of on-farm research.

G. Natural disasters

20. An important consideration in the use of land resources is to identify the susceptibility of specific land areas to the impact of natural disasters. During the period under review, USAID and the Office of Disaster Preparedness in Jamaica undertook one of the first efforts at natural hazard mapping in the Caribbean. The Organization of American States, with financial support from USAID, carried out landslide hazard assessment in the OECS countries, and is continuing with coastal storm surge hazard assessment, in conjunction with the Caribbean Meterological Institute. The Government of Jamaica has recently adopted new guidelines for land use planning, which calls for special zoning regulations.

21. The Caribbean Disaster Emergency Response Agency, in conjunction with FAO, is working with Eastern Caribbean States in developing the details of national and regional hurricane disaster preparedness and impact mitigation strategies related to agriculture, forestry and fisheries. Components include a review of information management in the sector, sector hurricane preparedness and mitigation action plans, and public education and awareness.

H. Physical planning and development

22. A number of initiatives have been pursued at the national and regional levels with the support of agencies, including Habitat/UNDP and the Organization of American States. Technical assistance to physical planning units has been supplied for the preparation of physical development plans, and for institutional strengthening through training of personnel and provision of GIS equipment. Initiatives include the preparation of building codes and guidelines, planning and infrastructure standards, physical planning legislation, national physical development plans and housing and land management policies.

III. Conclusions and recommendations for future action

A. National level

23. Critical efforts to better address land resources include the need to better understand land use objectives, land use options and trade-offs between uses; the need for institutional collaboration and coordination of ministries; the need to implement land dispute resolution systems; and the need to use technologies as a basis for land use decision-making.

24. Institutionally, there is a need to take an intersectoral approach to addressing the complex issues of land resources, wherever this is not already being done. This will entail the adoption of an integrated planning process, with an enhanced collaboration on the part of the government and all relevant non-governmental stakeholders to make the best use of the comparative advantage of each.

25. Numerous tools, approaches, techniques and guidelines have been developed by relevant United Nations and non-United Nations organizations, which small island developing States can take advantage of to address issues of land resources. A number of these modalities are currently being utilized or tried in individual small island developing States. There is a need, however, for training in the use and institutionalization of these tools, approaches and guidelines in all small island developing States.

26. Natural resource conservation should be strongly promoted by rehabilitating traditional attitudes and value systems, and by making people aware of the finite and fragile nature of those resources in today's conditions, particularly in small island developing States.

B. Regional level

27. Mechanisms must be put in place to enhance the communication networks that have been developed, as well as to develop those which are still needed. In view of the complexity and diversity of the natural resource management task and the difficulty and financial burden associated with the provision of the required multidisciplinary teams of

Box 5. The way forward: outcome of a Caribbean ministerial meeting on the Programme of Action for th Sustainable Development of Caribbean Small Island States, Barbados, 10-14 November 1997

In the chapter of its report on land resources, the meeting recommended:

(a) To encourage the United Nations Centre for Human Settlements (Habitat) to continue and expand assistance to the Caribbean Human Settlements Programme Office, in collaboration with other partners. This office will support elements of the Programme of Action and establish cooperative linkages with the implementation of the Caribbean Human Settlements Plan of Action. The Plan of Action has already been considered by the ministers responsible for housing and human settlements. Within this framework, Habitat should provide additional support for the improved availability, affordability and environmental quality of shelter in human settlements, in accordance with chapter 7 of Agenda 21;

(b) To support efforts by Caribbean small island developing States to further develop human settlements and environmental information/databases, which would also enhance the introduction or expansion of computer-based geographical information systems to inform policy decisions for sustainable development;

(c) The need for comprehensive land use plans recognizing the philosophy of island systems management, paying special attention to anthropogenic activities, particularly farming, settlements and industry, and their impacts on coastal and marine resources and biodiversity conservation needs;

(d) To support the systematic assessment and mapping of hazardous areas, and to incorporate this information in the formulation of land use regulations and building standards for the purpose of ensuring the safety of the population, reliability of infrastructure and sustainability of land use;

(e) To examine the integration of national forestry policies into larger frameworks for natural resources management at the national level;

(f) To explore the promotion of the Iwokrama rainforest programme (Guyana) as a model for appropriate land use and natural resource management policies at the national, regional and international levels;

(g) To pursue at the national and regional levels an approach for integrating human settlements, land use, disaster mitigation and other related programmes, projects and policies, as appropriate;

(h) To support the development of a land registration and titling system throughout the region, and consider the use of land dispute resolution systems in addition to the courts, improve training for lawyers, especially legal draughtsmen, on land titling and related issues, establish electronic registers for legal documents (as opposed to paper registers), and develop legislative and regulatory frameworks for information technology policy, administrative dispute resolution, and land tenure and distribution at the national level;

(i) To invite support for related integrated information initiatives by the UNEP Global Resource Information Database and the United Nations Centre for Regional Development at the international level; and the University of the West Indies, the Trinidad and Tobago GIS Association, and OECS/NRMU at the regional level.

professionals in each country, the establishment of an appropriate regional mechanism within one of the existing regional organizations might be considered. Such a mechanism would provide resource management services to small island Governments, make available skills and experience that would be much more difficult to build at the national level, and facilitate the transfer and sharing of technical information and research results.

28. Effective coordination of measures designed to take an integrated approach to the planning and management of land resources between regional institutions, including universities and relevant international programmes or initiatives, should be encouraged in all small island developing States regions where such measures have not yet been taken.

29. At a recent Caribbean ministerial meeting on the Programme of Action for the Sustainable Development of Caribbean Small Island States (Barbados, 1997), specific recommendations were made regarding land resources (see box 5). Similar recommendations pertinent to each region would be helpful in other regions.

C. International level

30. International agencies and organizations must better coordinate their efforts in assistance to small island developing States; assist in the strengthening and support of regional networks; facilitate the adoption and implementation of appropriate integrated planning processes for natural resources as a means of ensuring their sustainable use; provide technical assistance in support of information systems for effective decision-making regarding land resources, as well as to assess and revise national legislation, if needed; implement appropriate training programmes; and facilitate the application of databases in integrated land use planning and management.